

Will an object float?

$$F_{net} = \rho_f g V - w$$
$$= (\rho_{fluid} - \rho_{object}) g V$$

$\therefore$  if  $\rho_f < \rho_{obj} \rightarrow$  sinks

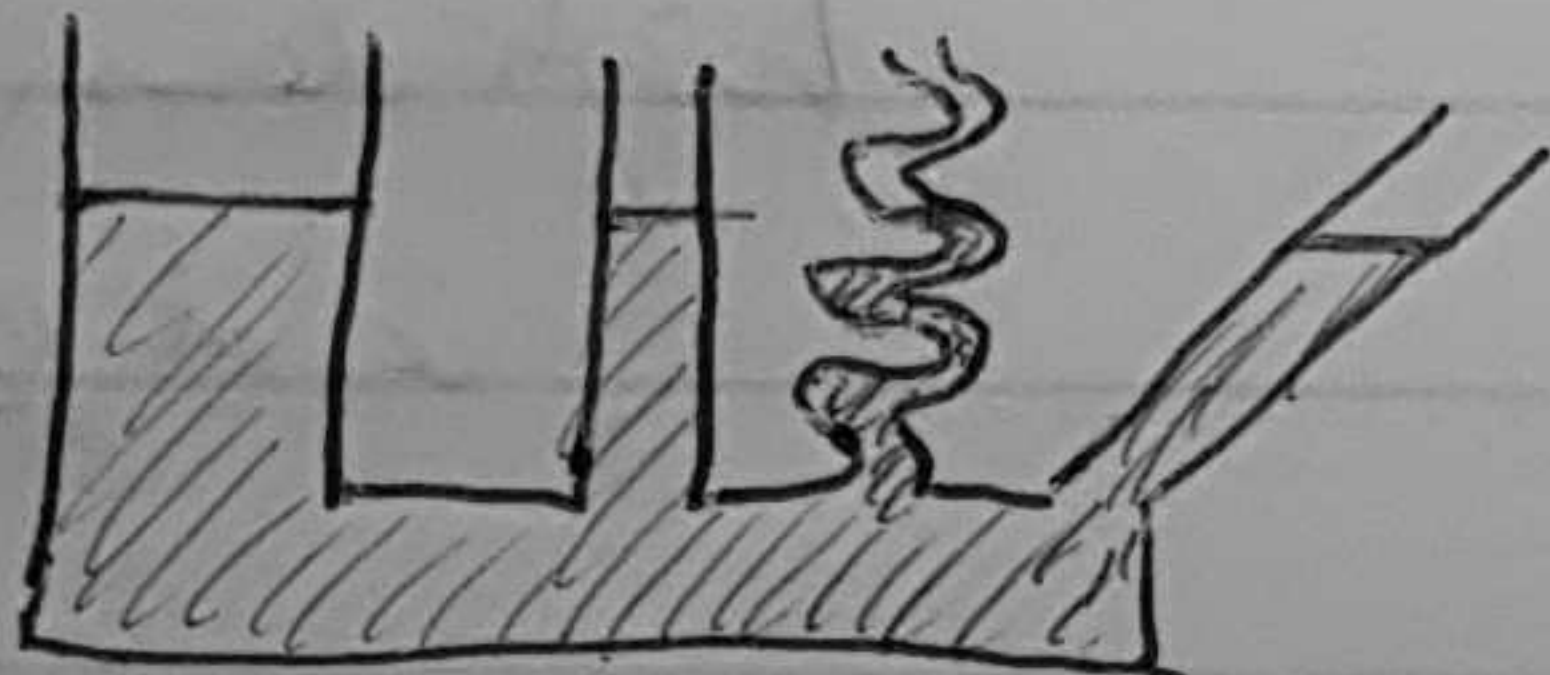
$\rho_f = \rho_{obj} \rightarrow$  neutral buoyancy

$\rho_f > \rho_{obj} \rightarrow$  floats.

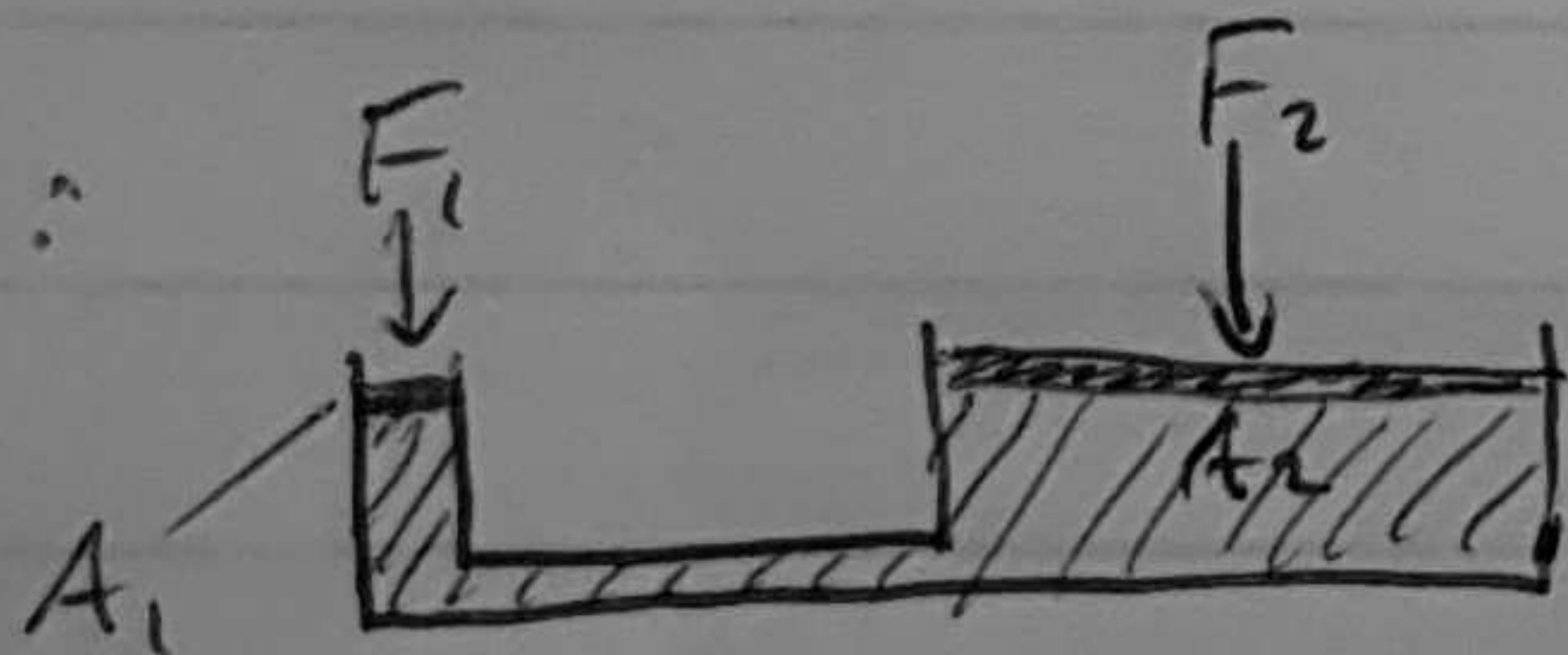
Pascal's Law: a change in pressure in an enclosed fluid at rest is transmitted undiminished to all points in the fluid.

Since  $p$  pressure only depends on depth of fluid,  
it does not depend on shape of container etc.

Pascal's vases:



Hydraulic press:

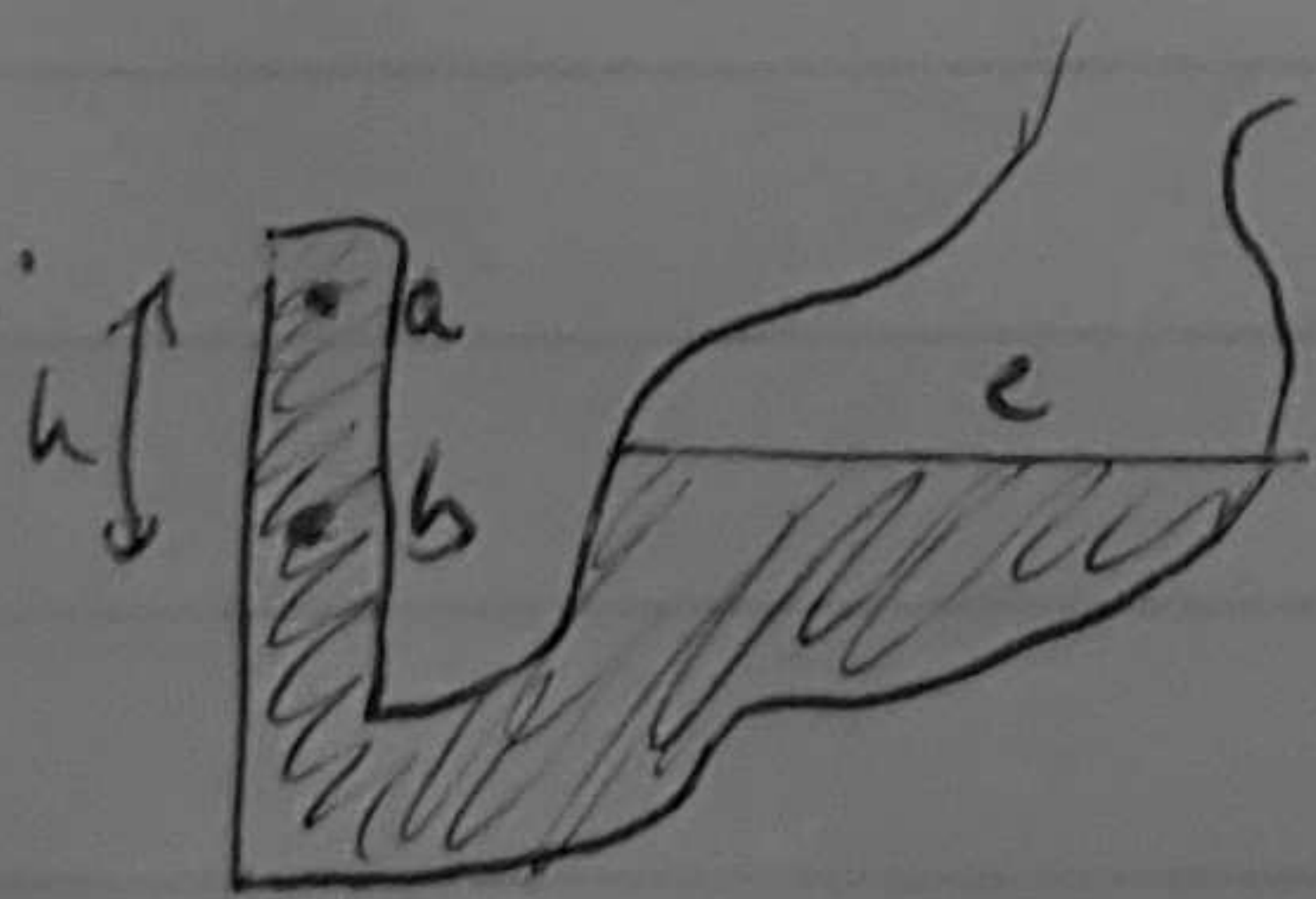


Since same pressure everywhere:

$$p = \frac{F_1}{A_1} = \frac{F_2}{A_2}$$

$$F_2 = \frac{A_2}{A_1} F_1$$

Negative pressure:



$$p_b = p_a + \rho g h$$

$$\text{but } p_b = p_c \approx 0$$

$$\therefore p_a \approx -\rho g h < 0$$

the liquid with -ve pressure: exerts an inward force on container

: small  $\uparrow$  in volume due to tensile stress

: adhesive forces stop it leaving walls of container